

17 August 2012

Mark Stinnett
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 Atlanta, GA 30328

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Subject: Certificate of Results

Dear Mark;

Attached to this narrative are the analytical results you requested on samples submitted for the determination of polychlorinated dibenzo-*p*-dioxins and dibenzofurans. The insert below summarizes the relevant information pertaining to your project. In particular, QC annotations bring to your attention specific analytical observations and assessments made during the sample handling and data interpretation phases. Results reported relate only to the items tested.

Project Information Summary		When applicable, see QC Annotations for details
Client Project Name		LPR Bench Test
AP Project No.		A4479
Analytical Protocol		EPA 1613B as per QAPP_SOP
No. Samples Submitted		3 sediments
No. Samples Analyzed		3
No. Laboratory Method Blanks		1
No. OPRs / Batch		1
No. Outstanding Samples		0
Date Received		9-Aug-2012
Condition Received		Good
Temperature upon Receipt (C)		4
Extraction within Holding Time		yes
Analysis within Holding Time		yes
Data meet QA/QC Requirements		yes
Exceptions		none
Analytical Difficulties		none

2714 Exchange Drive
 Wilmington, NC 28405
 Ph.: 910-794-1613

Standard Modifications of Published Method 1613B

Averaged front/back response factors from the BCS₃ are used to define response factors used in quantitation. The BCS₃ is used to calibrate the instrument, establish the RRFs used for quantitation, measure GC and Mass Spectrometer resolutions, and determine the retention time windows.

To ensure we can distinguish a faulty injection from the absence of carryover, a Solvent Blank Spiked is analyzed immediately after the analysis of the BCS₃. The spiked compounds are present at the 1 pg/μL level (i.e., another way to verify instrument sensitivity). For PCDD/Fs, only one non-2,3,7,8-TCDF isomer is used.

A number of additional labeled standards (vs. the published methods) are used throughout sample processing.

Extraction Standards (ES) (sometimes also referred to as internal standards): All seventeen 2,3,7,8-substituted PCDD/PCDFs (vs. 9 in method 8290A) are quantified against their corresponding ¹³C₁₂-labeled analog. This allows for true isotope-dilution quantitation of all 17 toxic 2,3,7,8 congeners.

Cleanup Standards: AP uses 5 labeled PCDD/PCDF Cleanup Standards (not present in the published method) to fully represent cleanup efficiency across homolog groups.

Alternate Standard (AS) (not present in published method) is added to the sample extract prior to fractionation. They can provide valuable feedback on possible selective losses, which can distort the PCDD/F congener profiles.

Injection Standards (IS) (sometimes also referred to as recovery standards): AP uses three PCDD/PCDF Injection Standards (2 in published method) to better represent recoveries of both tetra-substituted homologs.

QC Annotations:

1. Please see the attached appendices for a list of data qualifiers and lab identifiers that may be contained in the report.
2. Analysis was performed by method 1613B with modifications per the SOP in the RM10.9QAPP Rev3 document. Utilized performance criteria are as established in that SOP.
3. All samples were analyzed from an approximate 10g dry weight with a 5x dilution of the final extract

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The management and staff of SGS-Analytical Perspectives welcome customer feedback, both positive and negative, as we continually improve our services. Please visit our web site at www.ultratrace.com and click on the 'Leave Your Feedback Here!' link on the Home Page. Thank you for choosing SGS-Analytical Perspectives

Sincerely,



Todd Vile
Project Manager

2714 Exchange Drive
Wilmington, NC 28405
Ph.: 910-794-1613

APPENDIX A: DATA QUALIFIERS / DATA ATTRIBUTES	
B	The analyte is found in the method blank, at a level that is $\leq 10 \times$ the sample concentration.
C	Two or more congeners co-elute. In EDDs C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group are shown with the number of the lowest IUPAC co-eluter.
E	The reported concentration exceeds the calibration range (upper point of the calibration curve).
EMPC	Represents an Estimated Maximum Possible Concentration. EMPC's arise in cases where the signal/noise ratio is not sufficient for peak identification (the determined ion-abundance ratio is outside the allowed theoretical range), or where there is a co-eluting interference.
ETH	Indicates the presence of a diphenyl ether that appears to interfere with the quantitation of a furan. The reported concentration is the maximum.
H/h	If the standard recovery is below the method or SOP specified value "H" is assigned. If the obtained value is less than half the specified value "h" is assigned. ¹
J	Indicates that an analyte has a concentration below the reporting limit (lowest point of the calibration curve).
ND	Indicates a non-detect.
NR	Indicates a value that is not reportable.
PR	Due to interference, the associated congener is poorly resolved.
QI	Indicates the presence of a quantitative interference.
Ra	The new ratio – [Ra] -- for 2,3,7,8-TCDD following the ³⁷ Cl ₄ -2,3,7,8-TCDD correction is shown between squared brackets in the EDL column. ¹
SI	Denotes "Single Ion Mode" and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.
U	The analyte was not detected. The estimated detection limit (EDL) may be reported for this analyte.
V	The labeled standard recovery was found to be outside of the method control limits.
X	Indicates results reported from reinjection, refractionation, or repeat analyses.
APPENDIX B: LAB ID IDENTIFIERS	
AP	Indicates use of the archived portion of the sample extract.
CU	Indicates a sample that required additional clean-up prior to MS injection/processing.
D	Indicates a dilution of the sample extract. The number that follows the "D" indicates the dilution factor.
DE	Indicates a dilution performed with the addition of ES (extraction standard) solution.
DUP	Designation for a duplicate sample.
MS	Designation for a matrix spike.
MSD	Designation for a matrix spike duplicate.
RJ	Indicates a reinjection of the sample extract.
S	Indicates a sample split. The number that follows the "S" indicates the split factor.

¹Denotes data qualifiers/attributes whose use will be phased out over time

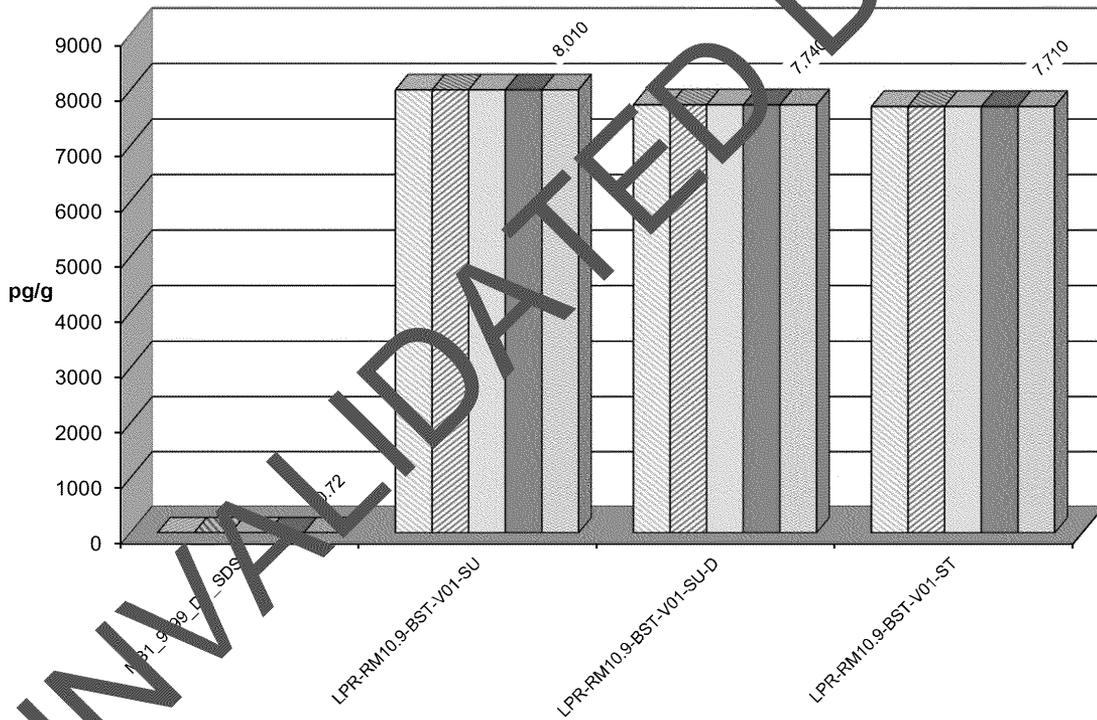
A4479 - TEQ
Project ID: LPR BENCH TEST

Sample Summary				Method 1613B	
Part 1 (dry weight)					
Analyte	MB1_9999_DF_SDS	LPR-RM10.9-BST-V01-SU	LPR-RM10.9-BST-V01-SU-D	LPR-RM10.9-BST-V01-ST	
	pg/g	pg/g	pg/g	pg/g	
2,3,7,8-TCDD	0.463	7730	7760	7480	
1,2,3,7,8-PeCDD	(0.144)	43.2	34.7	32.2	
1,2,3,4,7,8-HxCDD	(0.151)	19.1	20.4	16.3	
1,2,3,6,7,8-HxCDD	(0.149)	105	103	82.9	
1,2,3,7,8,9-HxCDD	(0.183)	51.1	51.2	44.5	
1,2,3,4,6,7,8-HpCDD	(0.24)	620	1650	1430	
OCDD	1.63	18500	21600	16500	
2,3,7,8-TCDF	(0.116)	174	149	160	
1,2,3,7,8-PeCDF	(0.128)	40.8	40.9	36.3	
2,3,4,7,8-PeCDF	(0.119)	172	168	144	
1,2,3,4,7,8-HxCDF	(0.109)	486	524	422	
1,2,3,6,7,8-HxCDF	(0.111)	129	135	110	
2,3,4,6,7,8-HxCDF	(0.119)	100	100	83.9	
1,2,3,7,8,9-HxCDF	(0.173)	(2.28)	(2.58)	(2.96)	
1,2,3,4,6,7,8-HpCDF	(0.156)	2080	2110	1760	
1,2,3,4,7,8,9-HpCDF	(0.145)	88.6	89.5	75.8	
OCDF	(0.213)	4060	4660	4010	
ITEF TEQ (ND=0; EMPC=0)	0.465	8,010	7,740	7,710	
ITEF TEQ (ND=0; EMPC=EMPC)	0.465	8,010	7,740	7,710	
ITEF TEQ (ND=DL/2; EMPC=0)	0.592	8,010	7,740	7,710	
ITEF TEQ (ND=DL/2; EMPC=EMPC)	0.592	8,010	7,740	7,710	
ITEF TEQ (ND=DL; EMPC=EMPC)	0.72	8,010	7,740	7,710	
Checkcode	065-884-PDV	070-600-HXZ	865-682-XZF	418-132-MBY	
Lab ID	MB1_9999_DF_SDS	A4479_9999_DF_001-D5	A4479_9999_DF_002-D5	A4479_9999_DF_003-D5	

() = DL
 [] = EMPC

ITEF-TEQ
Project ID: LPR BENCH TEST
A4479

- ND=0; EMPC=0
- ND=0; EMPC=EMPC
- ND=DL/2; EMPC=0
- ND=DL/2; EMPC=EMPC
- ND=DL; EMPC=EMPC



UNVALIDATED DATA

A4479 - WHO-2005-TEQ
Project ID: LPR BENCH TEST

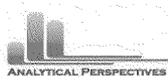
Sample Summary				Method 1613B	
Part 1 (dry weight)					
Analyte	MB1_9999_DF_SDS	LPR-RM10.9-BST-V01-SU	LPR-RM10.9-BST-V01-SU-D	LPR-RM10.9-BST-V01-ST	
	pg/g	pg/g	pg/g	pg/g	
2,3,7,8-TCDD	0.463	7730	7760	7480	
1,2,3,7,8-PeCDD	(0.144)	43.2	34.7	32.2	
1,2,3,4,7,8-HxCDD	(0.151)	19.1	20.4	16.3	
1,2,3,6,7,8-HxCDD	(0.149)	105	103	82.9	
1,2,3,7,8,9-HxCDD	(0.183)	51.1	51.2	44.5	
1,2,3,4,6,7,8-HpCDD	(0.24)	620	1650	1430	
OCDD	1.63	18500	21600	16500	
2,3,7,8-TCDF	(0.116)	174	149	160	
1,2,3,7,8-PeCDF	(0.128)	40.8	40.9	36.3	
2,3,4,7,8-PeCDF	(0.119)	172	168	144	
1,2,3,4,7,8-HxCDF	(0.109)	486	524	422	
1,2,3,6,7,8-HxCDF	(0.111)	129	135	110	
2,3,4,6,7,8-HxCDF	(0.119)	100	100	83.9	
1,2,3,7,8,9-HxCDF	(0.173)	(2.28)	(2.58)	(2.96)	
1,2,3,4,6,7,8-HpCDF	(0.156)	2080	2110	1760	
1,2,3,4,7,8,9-HpCDF	(0.145)	88.6	89.5	75.8	
OCDF	(0.213)	4060	4660	4010	
WHO-2005 TEQ (ND=0; EMPC=0)	0.464	7,980	7,700	7,680	
WHO-2005 TEQ (ND=0; EMPC=EMPC)	0.464	7,980	7,700	7,680	
WHO-2005 TEQ (ND=DL/2; EMPC=EMPC)	0.614	7,980	7,700	7,680	
WHO-2005 TEQ (ND=DL/2; EMPC=EMPC)	0.614	7,980	7,700	7,680	
WHO-2005 TEQ (ND=DL; EMPC=EMPC)	0.764	7,980	7,700	7,680	
Checkcode	065-884-PDV	070-600-HXZ	865-682-XZF	418-132-MBY	
Lab ID	MB1_9999_DF_SDS	A4479_9999_DF_001-D5	A4479_9999_DF_002-D5	A4479_9999_DF_003-D5	

() = DL
 [] = EMPC

WHO-2005-TEQ
Project ID: LPR BENCH TEST
A4479



A4479 - Totals
Project ID: LPR BENCH TEST

Sample Summary						Method 1613B	
Part 2 (dry weight)							
Analyte	MB1_9999_DF_SDS	LPR-RM10.9-BST-V01-SU	LPR-RM10.9-BST-V01-SU-D	LPR-RM10.9-BST-V01-ST			
	pg/g	pg/g	pg/g	pg/g			
Totals							
TCDDs	0.463	8830	8460	8380			
PeCDDs	0	367	337	297			
HxCDDs	0	73	760	629			
HpCDDs	0	2290	3530	2900			
OCDD	1.63	150	21600	16500			
TCDFs	0	5830	6030	4330			
PeCDFs	0	1220	4140	3210			
HxCDFs	0	2510	2610	2130			
HpCDFs	0	3500	3530	2950			
OCDF	0	4060	4660	4010			
Total PCDD/Fs (ND=0; EMPC=0)	2.09	51,900	55,600	45,300			
Total PCDD/Fs (ND=0; EMPC=EMPC)	2.09	51,900	55,600	45,400			
Total PCDD/Fs (2378-X ND=DL; EMPC=EMPC)	4.31	51,900	55,600	45,400			
Total 2378s (ND=0; EMPC=0)	2.09	35,400	38,900	32,400			
Total 2378s (ND=0.5; EMPC=0)	3.20	35,400	38,900	32,400			
Total 2378s (ND=1; EMPC=0)	4.31	35,400	38,900	32,400			
Total 2378s (ND=0; EMPC=1)	2.09	35,400	38,900	32,400			
Total 2378s (ND=0.5; EMPC=1)	3.20	35,400	38,900	32,400			
Total 2378s (ND=1; EMPC=1)	4.31	35,400	38,900	32,400			
Checkcode	065-884-PDV	070-600-HXZ	865-682-XZF	418-132-MBY			
Lab ID	MB1_9999_DF_SDS	A4479_9999_DF_001-D5	A4479_9999_DF_002-D5	A4479_9999_DF_003-D5			

() = DL
 [] = EMPC

A4479 - Others
Project ID: LPR BENCH TEST

Sample Summary Part 3 (dry weight)				Method 1613B	
Analyte	MB1_9999_DF_SDS	LPR-RM10.9-BST-V01-SU	LPR-RM10.9-BST-V01-SUD	LPR-RM10.9-BST-V01-ST	
	pg/g	pg/g	pg/g	pg/g	pg/g
Other PCDD/Fs (ND=0, EMPC=0)					
Other TCDD	0	1100	995	900	
Other PeCDD	0	334	302	265	
Other HxCDD	0	564	586	485	
Other HpCDD	0	1670	1880	1470	
Other TCDF	0	5650	5880	4170	
Other PeCDF	0	4010	3940	3030	
Other HxCDF	0	1800	1850	1520	
Other HpCDF	0	1330	1340	1110	
Other PCDD/Fs (ND=0, EMPC=EMPC)					
Other TCDD	0	1100	995	907	
Other PeCDD	0	333	302	274	
Other HxCDD	0	564	586	485	
Other HpCDD	0	1670	1880	1470	
Other TCDF	0	5650	5880	4170	
Other PeCDF	0	4010	3940	3030	
Other HxCDF	0	1800	1850	1520	
Other HpCDF	0	1330	1340	1110	
Checkcode	065-884-PDV	070-600-HXZ	865-682-XZF	418-132-MBY	
Lab ID	MB1_9999_DF_SDS	A4479_9999_DF_001-D5	A4479_9999_DF_002-D5	A4479_9999_DF_003-D5	

() = DL
 [] = EMPC

A4479 - DLs

Project ID: LPR BENCH TEST



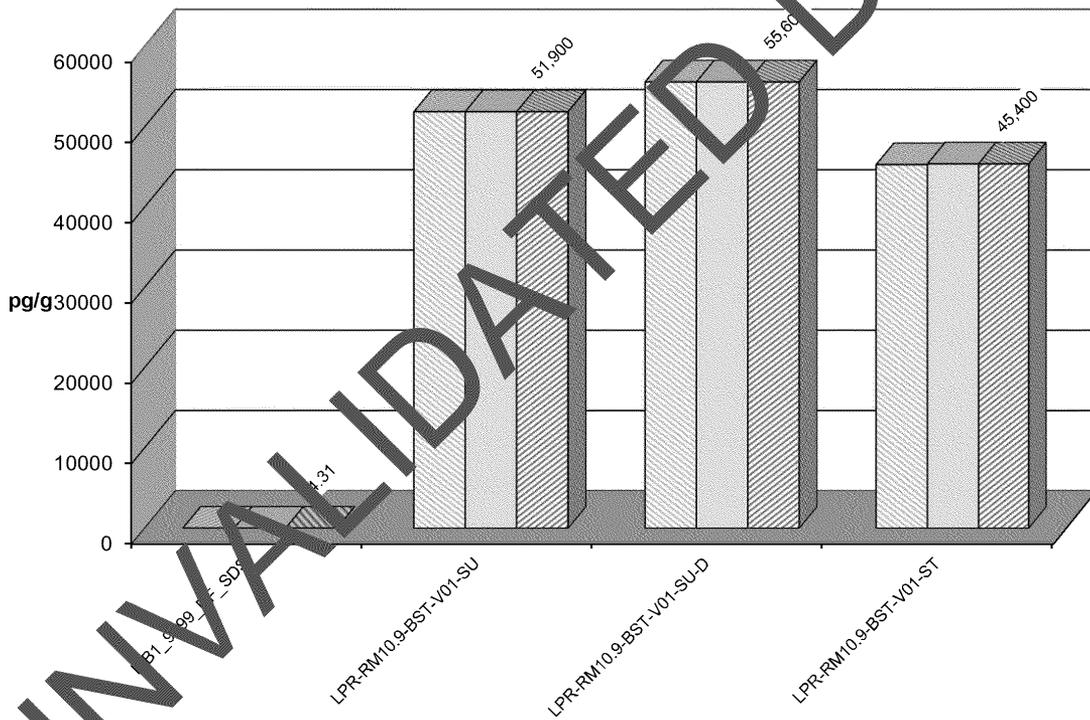
Method 1613B

Sample Summary Part 5 (DLs) (dry weight)				
Analyte	MB1_9999_DF_SDS	LPR-RM10.9-BST-V01-SU	LPR-RM10.9-BST-V01-SU-D	LPR-RM10.9-BST-V01-ST
	pg/g	pg/g	pg/g	pg/g
2,3,7,8-TCDD	0.171	0.477	0.474	0.773
1,2,3,7,8-PeCDD	0.144	0.81	0.763	1.13
1,2,3,4,7,8-HxCDD	0.151	1.33	1.4	1.93
1,2,3,6,7,8-HxCDD	0.149	1.41	1.36	1.81
1,2,3,7,8,9-HxCDD	0.183	1.92	1.55	2.28
1,2,3,4,6,7,8-HpCDD	0.24	0.632	0.891	1.17
OCDD	0.47	0.707	1.19	1.98
2,3,7,8-TCDF	0.116	0.358	0.554	0.684
1,2,3,7,8-PeCDF	0.128	1.27	1.39	1.75
2,3,4,7,8-PeCDF	0.119	1.28	1.3	1.6
1,2,3,4,7,8-HxCDF	0.109	1.72	1.92	2.21
1,2,3,6,7,8-HxCDF	0.111	1.77	1.69	2.03
2,3,4,6,7,8-HxCDF	0.129	2.07	1.95	2.22
1,2,3,7,8,9-HxCDF	0.177	2.28	2.58	2.96
1,2,3,4,6,7,8-HpCDF	0.106	0.418	0.428	0.529
1,2,3,4,7,8,9-HpCDF	0.145	0.534	0.482	0.713
OCDF	0.213	0.707	0.665	1.04
Total TCDD	0.171	0.477	0.474	0.773
Total PeCDD	0.144	0.81	0.763	1.13
Total HxCDD	0.16	1.45	1.43	1.99
Total HpCDD	0.24	0.632	0.891	1.17
Total TCDF	0.116	0.358	0.554	0.684
Total PeCDF	0.123	1.28	1.34	1.68
Total HxCDF	0.128	1.94	2	2.31
Total HpCDF	0.123	0.468	0.453	0.608
Checkcode	065-884-PDV	070-600-HXZ	865-682-XZF	418-132-MBY
Lab ID	MB1_9999_DF_SDS	A4479_9999_DF_001-D5	A4479_9999_DF_002-D5	A4479_9999_DF_003-D5

UNVALIDATED DATA

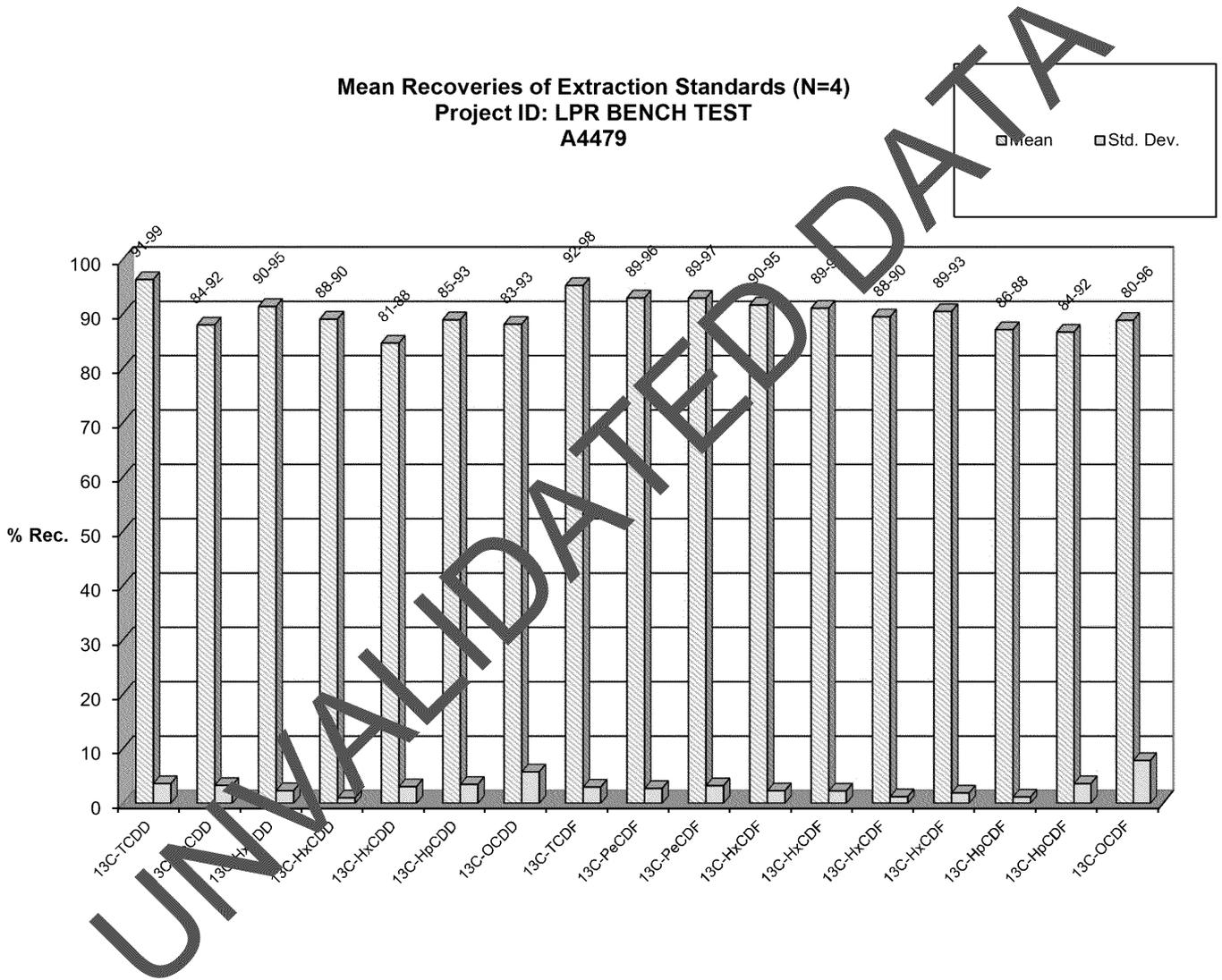
Totals
Project ID: LPR BENCH TEST
A4479

- Total PCDD/Fs (ND=0; EMPC=0)
- Total PCDD/Fs (ND=0; EMPC=EMPC)
- Total PCDD/Fs (278-X ND=DL; EMPC=EMPC)



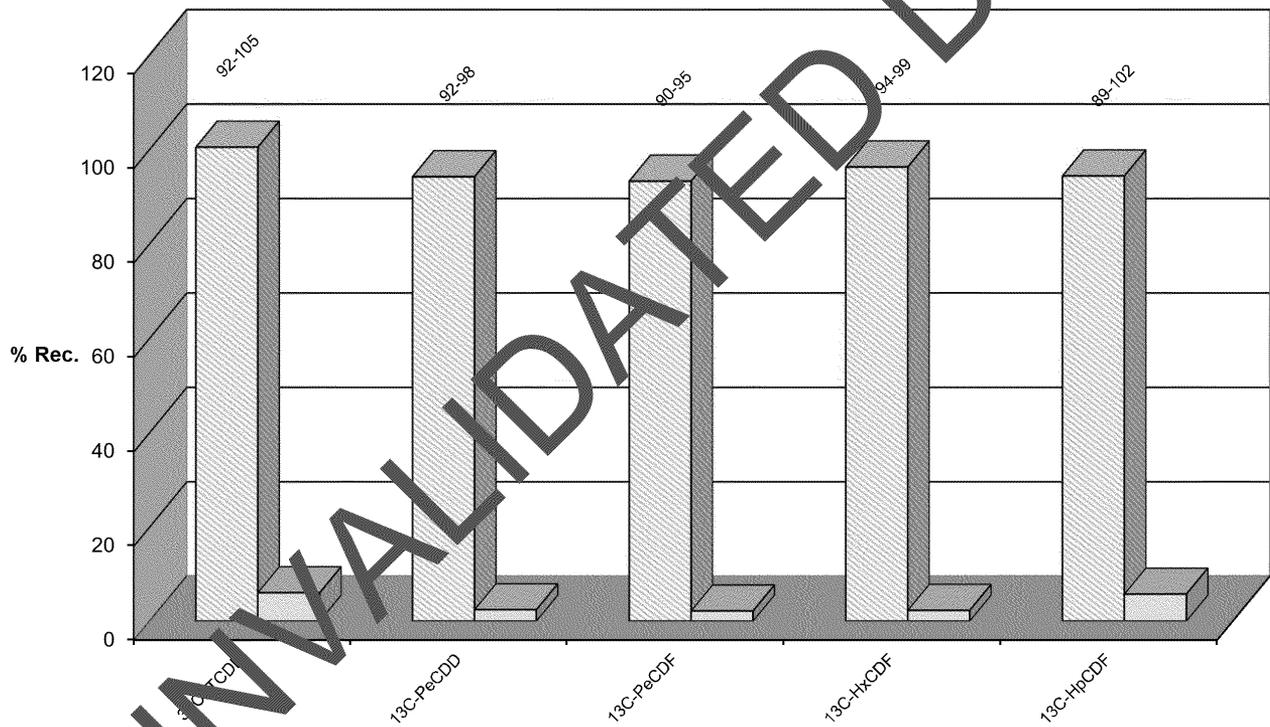
UNVALIDATED DATA

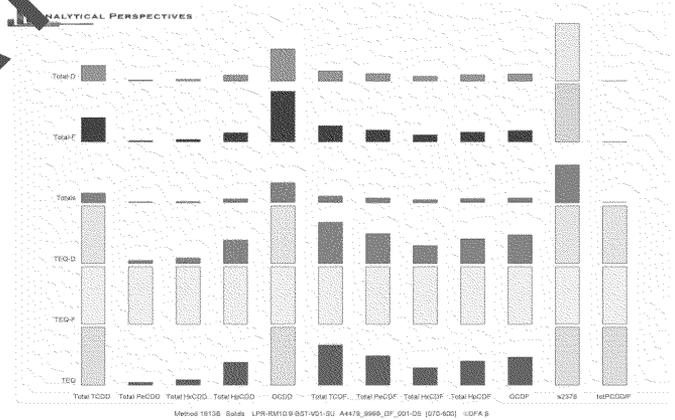
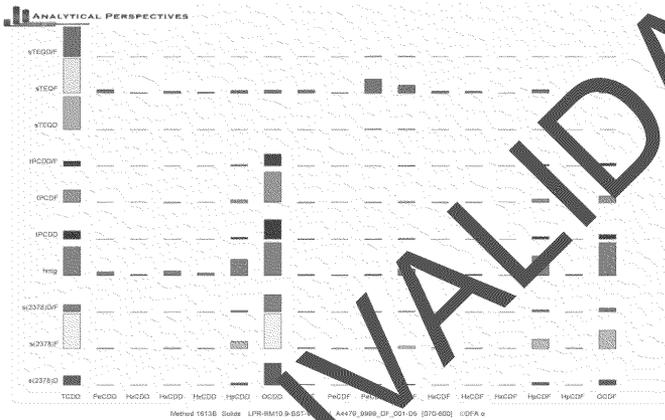
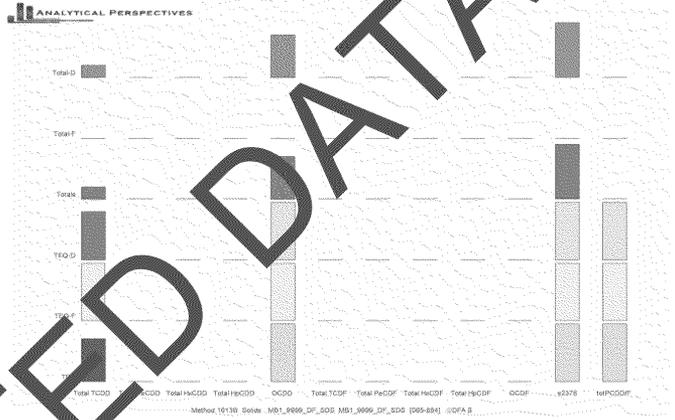
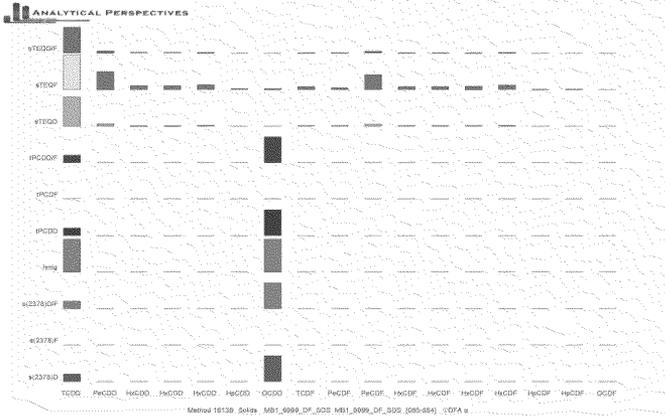
Mean Recoveries of Extraction Standards (N=4)
 Project ID: LPR BENCH TEST
 A4479



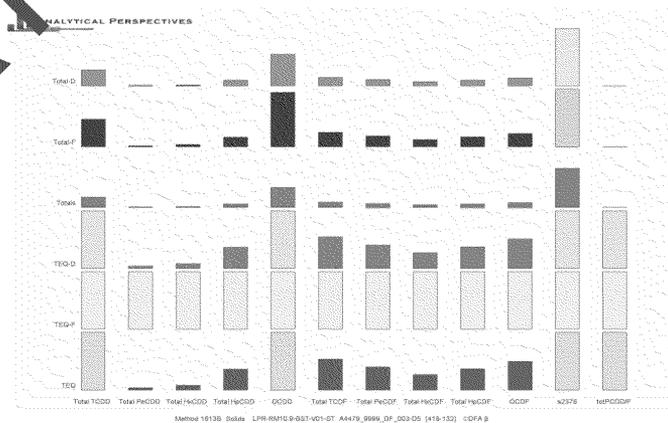
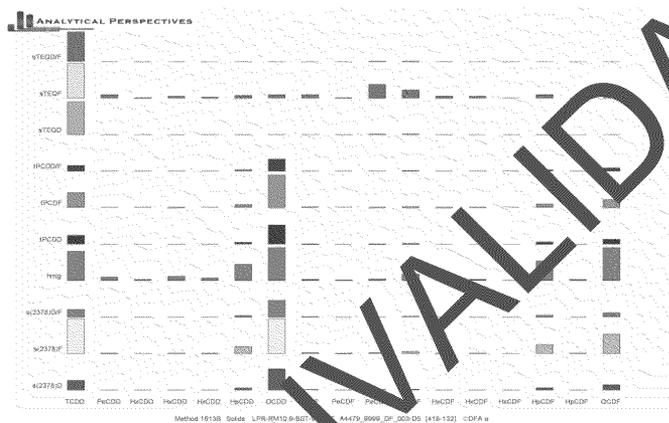
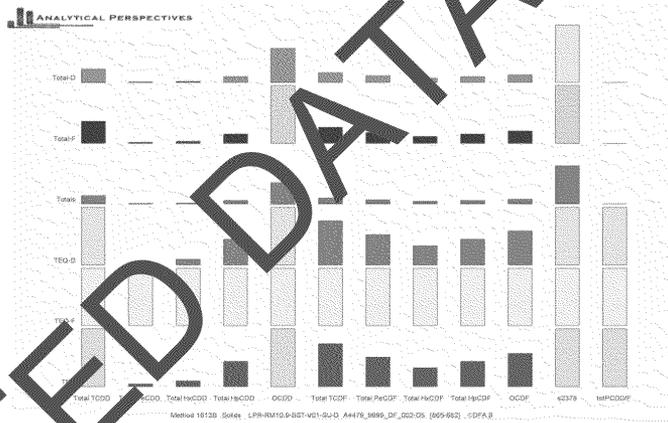
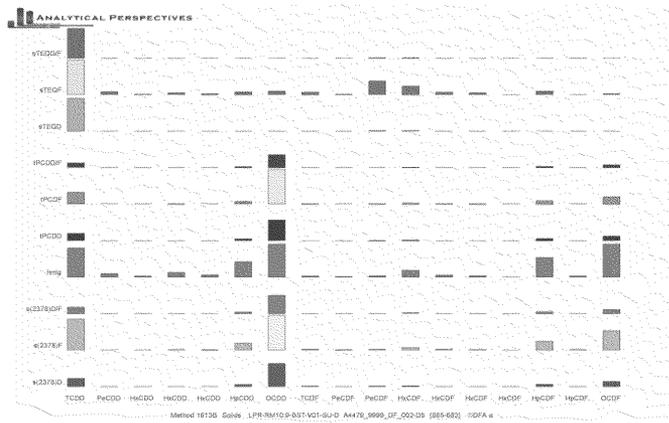
Mean Recoveries of Clean-Up Standards (N=4)
Project ID: LPR BENCH TEST
A4479

Mean Std. Dev.





UNVALIDATED DATA



UNVALIDATED DATA

Sample ID: MB1_9999_DF_SDS

Method 1613B

<u>Client Data</u>		<u>Sample Data</u>		<u>Laboratory Data</u>			
Name:	CH2M HILL	Matrix:	Solids	Lab Project ID:	A4479	Date Received:	10-Aug-2012
Project ID:	LPR BENCH TEST	Weight/Volume:	10.00 g	Lab Sample ID:	MB1_9999_DF_SDS	Date Extracted:	10-Aug-2012
Date Collected:	10-Aug-2012	% Solids:	100.0 %	QC Batch No:	9999	Date Analyzed:	16-Aug-2012
		Split:	-	Dilution:	-	Time Analyzed:	16:28:01
Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	Recoveries	Qualifiers
2378-TCDD	0.463			J	ES 2378-TCDD	91.4	
12378-PeCDD	ND	0.144			ES 12378-PeCDD	83.9	
123478-HxCDD	ND	0.151			ES 123478-HxCDD	91.5	
123678-HxCDD	ND	0.149			ES 123678-HxCDD	90.3	
123789-HxCDD	ND	0.183			ES 123789-HxCDD	87.5	
1234678-HpCDD	ND	0.24			ES 1234678-HpCDD	84.9	
OCDD	1.63			J	ES OCDD	82.6	
2378-TCDF	ND	0.116			ES 2378-TCDF	94.3	
12378-PeCDF	ND	0.128			ES 12378-PeCDF	89.3	
23478-PeCDF	ND	0.119			ES 23478-PeCDF	89	
123478-HxCDF	ND	0.109			ES 123478-HxCDF	90.2	
123678-HxCDF	ND	0.111			ES 123678-HxCDF	88.9	
234678-HxCDF	ND	0.129			ES 234678-HxCDF	90.3	
123789-HxCDF	ND	0.173			ES 123789-HxCDF	90.3	
1234678-HpCDF	ND	0.106			ES 1234678-HpCDF	86.9	
1234789-HpCDF	ND	0.145			ES 1234789-HpCDF	83.7	
OCDF	ND	0.215			ES OCDF	80.3	
Totals					Standard	CS/AS Recoveries	
Total TCDD	0.463		0.463		CS 37Cl-2378-TCDD	92.3	
Total PeCDD	ND	0.144	ND		CS 12347-PeCDD	92.6	
Total HxCDD	ND	0.16	ND		CS 12346-PeCDF	90.5	
Total HpCDD	ND	0.24	ND		CS 123469-HxCDF	94.1	
Total TCDF	ND	0.116	ND		CS 1234689-HpCDF	89.1	
Total PeCDF	ND	0.123	ND		AS 1368-TCDD	99	
Total HxCDF	ND	0.128	ND		AS 1368-TCDF	96.5	
Total HpCDF	ND	0.123	ND				
Total PCDD/Fs	2.09		2.09				
ITEF TEQs							
TEQ: ND=0	0.465		0.465				
TEQ: ND=DL	0.592	0.213	0.592				
TEQ: ND=DL	0.72	0.426	0.72				



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Sample ID: LPR-RM10.9-BST-V01-SU

Method 1613B

Client Data		Sample Data		Laboratory Data		Analysis Data	
Name:	CH2M HILL	Matrix:	Solids	Lab Project ID:	A4479	Date Received:	09-Aug-2012
Project ID:	LPR BENCH TEST	Weight/Volume:	14.42 g	Lab Sample ID:	A4479_9999_DF_001-D5	Date Extracted:	10-Aug-2012
Date Collected:	08-Aug-2012	% Solids:	47.0 %	QC Batch No:	9999	Date Analyzed:	16-Aug-2012
		Split:	-	Dilution:	-	Time Analyzed:	17:18:18
Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	Recoveries	Qualifiers
2378-TCDD	7730			E	ES 2378-TCDD	99.4	
12378-PeCDD	43.2				ES 12378-PeCDD	88	
123478-HxCDD	19.1				ES 123478-HxCDD	94.6	
123678-HxCDD	105				ES 123678-HxCDD	89	
123789-HxCDD	51.1				ES 123789-HxCDD	86.7	
1234678-HpCDD	1620				ES 1234678-HpCDD	90	
OCDD	18500			E	ES OCDD	92.9	
2378-TCDF	174				ES 2378-TCDF	98.1	
12378-PeCDF	40.8				ES 12378-PeCDF	95.5	
23478-PeCDF	172				ES 23478-PeCDF	93.4	
123478-HxCDF	486				ES 123478-HxCDF	94.8	
123678-HxCDF	129				ES 123678-HxCDF	91.8	
234678-HxCDF	100				ES 234678-HxCDF	89.5	
123789-HxCDF	ND	2.28			ES 123789-HxCDF	93.1	
1234678-HpCDF	2080				ES 1234678-HpCDF	88.4	
1234789-HpCDF	88.6				ES 1234789-HpCDF	85.9	
OCDF	4060				ES OCDF	94.9	
Totals					Standard	CS/AS Recoveries	
Total TCDD	8830		8840		CS 37Cl-2378-TCDD	105	
Total PeCDD	367		376		CS 12347-PeCDD	94.3	
Total HxCDD	739		739		CS 12346-PeCDF	92.8	
Total HpCDD	3290		3290		CS 123469-HxCDF	97.3	
Total TCDF	5830		5830		CS 1234689-HpCDF	95.3	
Total PeCDF	4220		4220		AS 1368-TCDD	85.7	
Total HxCDF	2511		2520		AS 1368-TCDF	89.2	
Total HpCDF	3500		3500				
Total PCDD/Fs	51900		51900				
ITEF TEQs							
TEQ: ND=0	8010		8010				
TEQ: ND=DL	8010	1.43	8010				
TEQ: ND=DL	8010	2.86	8010				



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Sample ID: LPR-RM10.9-BST-V01-SU-D

Method 1613B

Client Data		Sample Data		Laboratory Data		Method 1613B	
Name:	CH2M HILL	Matrix:	Solids	Lab Project ID:	A4479	Date Received:	09-Aug-2012
Project ID:	LPR BENCH TEST	Weight/Volume:	14.97 g	Lab Sample ID:	A4479_9999_DF_002-D5	Date Extracted:	10-Aug-2012
Date Collected:	08-Aug-2012	% Solids:	47.5 %	QC Batch No:	9999	Date Analyzed:	16-Aug-2012
		Split:	-	Dilution:	-	Time Analyzed:	18:08:34
Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	Recoveries	Qualifiers
2378-TCDD	7460			E	ES 2378-TCDD	96	
12378-PeCDD	34.7				ES 12378-PeCDD	88.2	
123478-HxCDD	20.4				ES 123478-HxCDD	89.5	
123678-HxCDD	103				ES 123678-HxCDD	87.9	
123789-HxCDD	51.2				ES 123789-HxCDD	83.5	
1234678-HpCDD	1650				ES 1234678-HpCDD	93.1	
OCDD	21600			E	ES OCDD	93.3	
2378-TCDF	149				ES 2378-TCDF	91.5	
12378-PeCDF	40.9				ES 12378-PeCDF	92.7	
23478-PeCDF	168				ES 23478-PeCDF	92.5	
123478-HxCDF	524				ES 123478-HxCDF	89.8	
123678-HxCDF	135				ES 123678-HxCDF	89.7	
234678-HxCDF	100				ES 234678-HxCDF	87.8	
123789-HxCDF	ND	2.58			ES 123789-HxCDF	89.8	
1234678-HpCDF	2110				ES 1234678-HpCDF	85.7	
1234789-HpCDF	89.5				ES 1234789-HpCDF	91.9	
OCDF	4660				ES OCDF	96.1	
Totals					Standard	CS/AS Recoveries	
Total TCDD	8460		8460		CS 37Cl-2378-TCDD	105	
Total PeCDD	337		337		CS 12347-PeCDD	97.5	
Total HxCDD	760		760		CS 123469-HxCDF	95.4	
Total HpCDD	3530		3530		CS 1234689-HpCDF	98.9	
Total TCDF	6030		6030		AS 1368-TCDD	102	
Total PeCDF	4140		4140		AS 1368-TCDF	91.2	
Total HxCDF	2610		2610			90.7	
Total HpCDF	3530		3530				
Total PCDD/Fs	55600		55600				
ITEF TEQs							
TEQ: ND=0	7740		7740				
TEQ: ND=DL	7740	1.45	7740				
TEQ: ND=DL	7740	2.9	7740				

Checkcode: 865-682-XZF

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Report Created: 17-Aug-2012 09:00 Analyst: MC

FOIA_07123_0005979_0019

Sample ID: LPR-RM10.9-BST-V01-ST

Method 1613B

Client Data		Sample Data		Laboratory Data		Analysis Data	
Name:	CH2M HILL	Matrix:	Solids	Lab Project ID:	A4479	Date Received:	09-Aug-2012
Project ID:	LPR BENCH TEST	Weight/Volume:	13.85 g	Lab Sample ID:	A4479_9999_DF_003-D5	Date Extracted:	10-Aug-2012
Date Collected:	08-Aug-2012	% Solids:	69.7 %	QC Batch No:	9999	Date Analyzed:	16-Aug-2012
		Split:	-	Dilution:	-	Time Analyzed:	18:58:41
Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	Recoveries	Qualifiers
2378-TCDD	7480			E	ES 2378-TCDD	98.6	
12378-PeCDD	32.2				ES 12378-PeCDD	91.9	
123478-HxCDD	16.3				ES 123478-HxCDD	90	
123678-HxCDD	82.9				ES 123678-HxCDD	89.1	
123789-HxCDD	44.5				ES 123789-HxCDD	80.9	
1234678-HpCDD	1430				ES 1234678-HpCDD	87.8	
OCDD	16500			E	ES OCDD	83.7	
2378-TCDF	160				ES 2378-TCDF	97.1	
12378-PeCDF	36.3				ES 12378-PeCDF	94.4	
23478-PeCDF	144				ES 23478-PeCDF	96.8	
123478-HxCDF	422				ES 123478-HxCDF	91.9	
123678-HxCDF	110				ES 123678-HxCDF	93.9	
234678-HxCDF	83.9				ES 234678-HxCDF	90.4	
123789-HxCDF	ND	2.96			ES 123789-HxCDF	88.7	
1234678-HpCDF	1760				ES 1234678-HpCDF	87.5	
1234789-HpCDF	75.8				ES 1234789-HpCDF	85.2	
OCDF	4010				ES OCDF	84.1	
Totals					Standard	CS/AS Recoveries	
Total TCDD	8380		8380		CS 37Cl-2378-TCDD	99.5	
Total PeCDD	297		306		CS 12347-PeCDD	92.3	
Total HxCDD	629		629		CS 12346-PeCDF	94.3	
Total HpCDD	2900		2900		CS 123469-HxCDF	94.7	
Total TCDF	4330		4330		CS 1234689-HpCDF	91	
Total PeCDF	3210		3210		AS 1368-TCDD	98.5	
Total HxCDF	2140		2140		AS 1368-TCDF	99.6	
Total HpCDF	2950		2950				
Total PCDD/Fs	45,000		45400				
ITEF TEQs							
TEQ: ND=0	7710		7710				
TEQ: ND=DL	7710	1.93	7710				
TEQ: ND=DL	7710	3.87	7710				



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Sample DUP		Method 1631B	
A4479		Sample ID: LPR-RM10.9-BST-V01-90	
Analyte	A4479_9999_DF_001-D5 pg/g	A4479_9999_DF_002-D5 (DUP) pg/g	RPD
2,3,7,8-TCDD	7734.25	7462.09	3.6%
1,2,3,7,8-PeCDD	43.21	34.70	21.9%
1,2,3,4,7,8-HxCDD	19.09	20.38	6.5%
1,2,3,6,7,8-HxCDD	105.31	112.51	2.7%
1,2,3,7,8,9-HxCDD	51.11	51.21	0.2%
1,2,3,4,6,7,8-HpCDD	1618.07	1554.36	2.2%
OCDD	18535.06	21560.15	15.1%
2,3,7,8-TCDF	174.20	163.77	15.7%
1,2,3,7,8-PeCDF	40.78	40.92	0.3%
2,3,4,7,8-PeCDF	172.12	168.32	2.2%
1,2,3,4,7,8-HxCDF	485.99	523.66	7.5%
1,2,3,6,7,8-HxCDF	128.9	135.4	4.9%
2,3,4,6,7,8-HxCDF	100.34	100.09	0.3%
1,2,3,7,8,9-HxCDF	0.0	0.0	n/a
1,2,3,4,6,7,8-HpCDF	2077.4	2107.2	1.4%
1,2,3,4,7,8,9-HpCDF	83.6	89.5	1.0%
OCDF	4060.2	4658.2	13.6%
Totals			
Total TCDD	8835.90	8457.52	4.4%
Total PeCDD	375.91	336.55	11.0%
Total HxCDD	739.04	760.38	2.8%
Total HpCDD	3285.18	3532.54	7.3%
Total TCDF	5825.73	6028.15	3.4%
Total PeCDF	4224.29	4144.39	1.9%
Total HxCDF	2517.55	2606.50	3.5%
Total HpCDF	3496.27	3532.38	1.0%

Note: EM/MS values used whenever available

Reviewer TV
Date 17 Aug 2012